



**(43) International Publication Date**  
**31 March 2005 (31.03.2005)**

**PCT**

**(10) International Publication Number**  
**WO 2005/029170 A1**

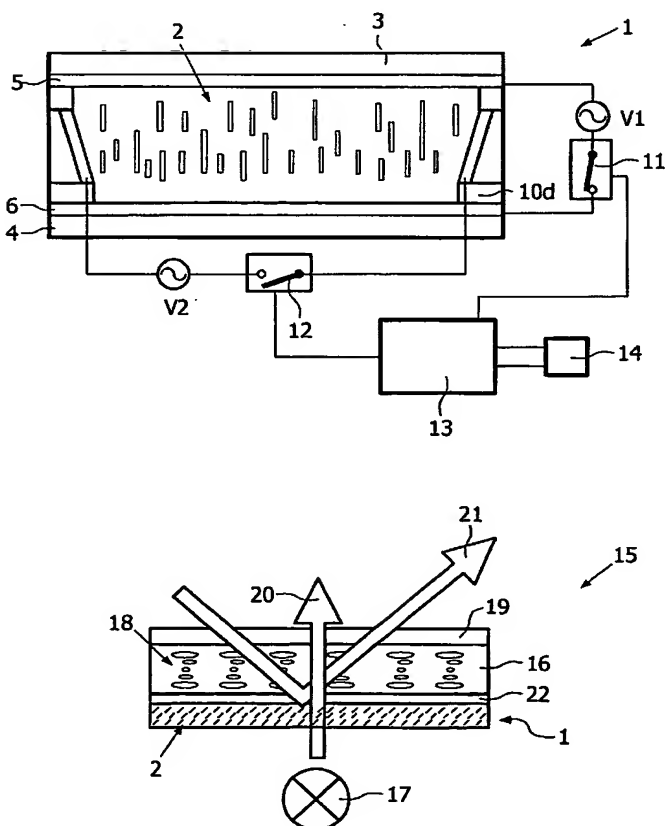
- (51) **International Patent Classification<sup>7</sup>:** **G02F 1/137,**  
1/17
- (21) **International Application Number:**  
PCT/IB2004/051734
- (22) **International Filing Date:**  
10 September 2004 (10.09.2004)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**  
0322231.2 23 September 2003 (23.09.2003) GB
- (71) **Applicant (for all designated States except US): KONIN-  
KLIJKE PHILIPS ELECTRONICS N.V. [NL/NL];**  
Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).
- (72) **Inventors; and**
- (75) **Inventors/Applicants (for US only): VERHAEGH,**

Nynke, A., M. [NL/NL]; c/o Philips Intellectual Property & Standards, Cross Oak Lane, Redhill Surrey RH1 5HA (GB). DE BOER, Dirk, K., G. [NL/NL]; c/o Philips Intellectual Property & Standards, Cross Oak Lane, Redhill Surrey RH1 5HA (GB). JOHNSON, Mark, T. [GB/NL]; c/o Philips Intellectual Property & Standards, Cross Oak Lane, Redhill Surrey RH1 5HA (GB). VAN DER HELJDEN, Bas [NL/NL]; c/o Philips Intellectual Property & Standards, Cross Oak Lane, Redhill Surrey RH1 5HA (GB).

- (74) **Agent:** WHITE, Andrew, G.; c/o Philips Intellectual Property & Stan, Cross Oak Lane, Redhill Surrey RH1 5HA (GB).
- (81) **Designated States** (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,

*[Continued on next page]*

- (54) Title:** SWITCHABLE TRANSFLECTOR AND TRANSFLECTIVE DISPLAY



**(57) Abstract:** A switchable translector (1) comprises a suspended particle device (SPD). The translector (1) may be switched into transmissive, reflective or intermediate states by applying one or more electric fields to a particle suspension (2). An enhanced reflectivity state may be achieved by applying two mutually orthogonal electric fields simultaneously. An intermediate state may be achieved by applying a non-saturating electric field or by applying two or more electric fields alternately according to a timing scheme. The translector (1) may be maintained in a given state by applying voltage pulses at intervals less than a relaxation time associated with the SPD 1. The transmittance and reflectance properties of the translector (1) may be tuned in accordance with the output of a light sensor (14). The translector (1) may be incorporated in a transmissive display (15) which comprises a display device, such as an LCD (16). In order to illuminate the LCD (16), the translector (1) is arranged to transmit light (20) emitted by a light source (17) and/or reflect ambient light (21). The relative proportions of transmitted and reflected illumination may be determined by the output of the light sensor (14).



KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

- (84) **Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Declaration under Rule 4.17:**

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE,*

*EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)*

**Published:**

- *with international search report*

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*